Claims

1. A hot-melt adhesive comprising a non-pressure-sensitive adhesive that is fluid at application temperatures and that is removable, residue-free, by peeling at small peel angles, wherein the improvement comprises that said adhesive contains additives selected from the group consisting of fillers, stabilizers, dyes, carbon black, and moisture absorbents, said adhesive also containing the following:

a) thermoplastic elastomers that may be grafted,

b) grafted poly-α-olefins,

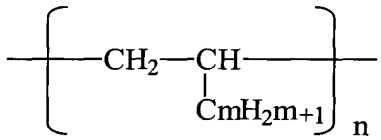
c) polyisobutylene or a softening oil,

d) adhesive resin, and

e) end block resin.

2. The adhesive according to claim 1, wherein the thermoplastic elastomers are styrenes selected from the group consisting of SBS, SIS, SEBS, SEPS, and block polystyrene-(block poly(ethylene-butylene)), block polystyrene-(block poly(ethylene-butylene)) having 1 to 10 block styrene units per molecule, which optionally are modified with block polyisoprene or block butadiene units; elastomer alloys selected from the group consisting of EPDM/PP, NR/PP, EVA/PVDC, and NBR/PP, polyurethane, polyether esters, or polyamides.

3. The adhesive according to claim 1, wherein the poly-α-olefins are at least partially grafted, and the poly-α-olefins are selected from amorphous poly-α-olefins, monopolymers, copolymers, or terpolymers of the monomers ethylene, propylene, 1-butene, 1-pentene, and 1-hexene, or from a poly-α-olefin of the general formula (I):



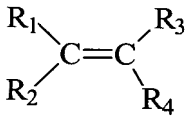
where

m = 0 to 15, and

n = 5 to 50,000.

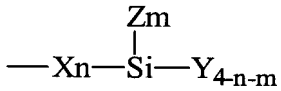
4. The adhesive according to claim 3, wherein the poly-α-olefins are semicrystalline, and the poly-α-olefins comprise at least one of polyethylene, polypropylene, or poly-1-butene, which have high tacticity in the crystalline regions.

5. The adhesive according to claim 3 or 4, wherein the poly-α-olefins are randomly grafted with olefinically unsaturated compounds, which in particular are selected from maleic anhydride, itaconic anhydride, tetrahydrophthalic anhydride, and compounds of the general formula (II):



where

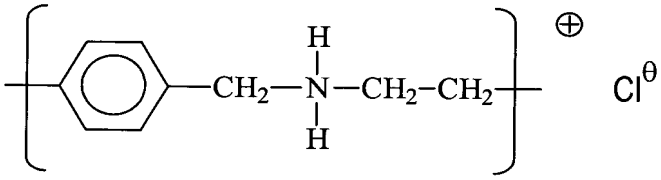
R_1 represents the following groups:

a) 

where

Z is hydrogen, a methyl group, or a phenyl group, and

X is $-(-CH_2-)_1-$ or



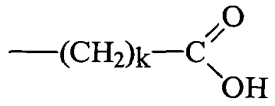
where

Y is a hydrolyzable group,

m 0,1, or 2,

n is 0, 1, or 2, and

l is 1, 2, 3, 4, 5, or 6; or

b) 

where

k is 0, 1, or 2,

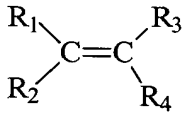
R_2 is hydrogen or methyl,

R_3 is an R_1 group, hydrogen, or methyl, and

R_4 is hydrogen or methyl.

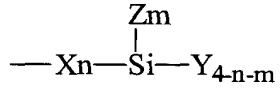
6. An adhesive according to claim 1, wherein the quantity of grafted poly-α-olefins is 0 to 100% by weight, relative to the total content of poly-α-olefins.

7. The adhesive according to Claim 1, wherein the thermoplastic elastomers are randomly grafted with olefinically unsaturated compounds that are selected from maleic anhydride, itaconic anhydride, tetrahydrophthalic anhydride, or compounds of the general formula (II):



where

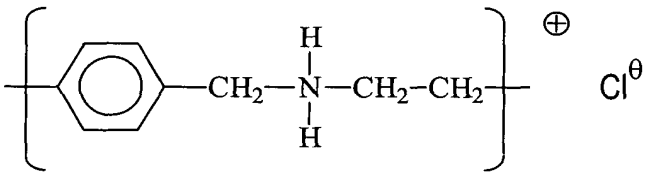
R_1 represents the following groups:

a) 

where

Z is hydrogen, a methyl group, or a phenyl group, and

X is $-(-CH_2-)_1-$ or



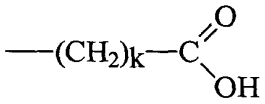
where

Y is a hydrolyzable group,

m 0,1, or 2,

n is 0, 1, or 2, and

l is 1, 2, 3, 4, 5, or 6; or

b) 

where

k is 0, 1, or 2,

R_2 is hydrogen or methyl,

R_3 is an R_1 group, hydrogen, or methyl, and

R_4 is hydrogen or methyl.

8. The adhesive according to claim 1, wherein the percentage of grafted thermoplastic elastomers, relative to the total content of the thermoplastic elastomers, is 0 to 100% by weight.

9. The adhesive according to claim 1, wherein the adhesive resins are selected from polymeric monomers of the petrochemical C_5 to C_9 distillation fractions, which are not hydrated partially hydrated, or completely hydrated, natural rosin resins, modified natural rosin resins, terpene resins, polyterpene resins of β-pinene, α-pinene, and/or δ-limonene; resins obtained by copolymerization of terpene with monomers from the C_5 to C_9 fraction from petroleum distillation, or terpene-phenol resins.

10. The adhesive according to claim 1, wherein the polyisobutylenes are at least one selected from the group consisting of homopolymers of isobutylene of average molecular weight in the range of 20,000 to 5,000,000 g x mol^{-1} (determined by gel permeation chromatography), copolymers of isobutylene and a conjugated diene in quantities of 0.3 to 4.5 mol% (relative to said copolymer), terpolymers of isobutylene, divinylbenzene in quantities of 0.01 to 4.5 mol%, and the named conjugated diene.

11. The adhesive according to claim 1, wherein the polyisobutylenes or softening oils are selected from polyisobutylenes, oligomers or polymers of isobutylene or 1-butene, or and modified naphthalene- or paraffin-based oils recovered from petroleum distillation with an average molecular weight in the range of 200 to 20,000 g x mol^{-1} (determined using gel permeation chromatography).

12. The adhesive according to one of claims 1 through 11, wherein said adhesive contains:
f) 0 to 80% by weight, preferably 15 to 70% by weight of polyisoprene, polybutadiene, grafted polyisoprene or polybutadiene.

13. The adhesive according to one of claims 1 through 12, wherein said adhesive contains:
g) 0 to 50% by weight, preferably 0 to 40% by weight, fillers; and
h) 0 to 25% by weight, preferably 0 to 10% by weight, aromatic resins and/or stabilizers.

14. The adhesive according to claim 13, wherein the fillers are inorganic fillers selected from the group consisting of calcium carbonate, calcium hydroxide, calcium oxide, dolomite, titanium dioxide, zinc oxide, silicon oxide, barium sulfate, manganese dioxide; or the fillers are an organic filler which is preferably carbon black.

15. The adhesive according to claim 13, wherein the stabilizers are selected from the group consisting of epoxides, sterically hindered phenols, amines, thioesters, phosphites, and triazine-, piperidine-, and benzotriazoles.

16. The adhesive according to one of claims 1 through 15, wherein said adhesives contain adhesives comprising at least one of epoxy resins, silicones, polysulfides, polyurethanes, polyureas, or acrylates.

17. An adhesive method which comprises:
attaching glass-like substrates to thermoplastic or duroplastic plastic substrates using the adhesive set forth in any one of claims 1-16.

18. The method according to claim 17, wherein the glass-like plastic substrates are selected from polymethyl methacrylate, polycarbonate, or cycloolefin copolymer, and preferably said plastic substrates are selected from polypropylene.

19. The method according to claim 17 or 18, wherein light disks or headlight lenses are releasably attached to lamp housings of automobile lights or automobile headlights.

20. In a joint between a first assembly part (6) and a second assembly part (7) which have mutually adjoining side walls (11, 18), and which are tightly attachable to one another by means of a sealing bed (8) that can be provided with a removable adhesive sealant (1), wherein the improvement comprises the first side wall (11) having a first sealing surface (15) attached thereto, which in the joined state runs at a distance (22) approximately parallel to a second sealing surface (21) that is attached to the second side wall (18), and that both of said sealing surfaces (15, 21) form the sealing bed (8) with a level running direction (16), directed away from both side walls (11, 18), in whose extension said adhesive sealing material (1) can be withdrawn.

21. The joint according to claim 20, wherein the running direction (16) of the sealing bed (8) is inclined toward the first side wall (11) at an angle of inclination (α).

22. The joint according to claim 21, wherein the angle of inclination (α) is between 0° and 180°.

23. The joint according to claim 22, wherein the angle of inclination (α) is between 0° and 90°.

24. The joint according to claim 23, wherein the angle of inclination (α) is approximately 30°.

25. The joint according to one of claims 20 through 24, wherein both assembly parts (6, 7) are fixed in position with one another by the attachment means (29) adjoining the sealing surfaces (15, 21).

26. The joint according to one of claims 20 through 25, wherein the first side wall (11) makes contact with a front face (24), disposed at the free end (23) of same, against the inner surface (25) of the

second assembly part (7), and that said front face (24) has conical tips (26) against which said inner surface (25) of second assembly part (7) can be pressed.

27. The joint according to one of claims 20 through 26, wherein the first assembly part (6) is constructed as a headlight housing (10), and the second assembly part (7) is constructed as a closure disk (17) of an automobile headlight.

28. The joint according to claim 27, wherein the closure disk (17) is constructed of a glass-like plastic substrate, and the headlight housing (10) is constructed of a thermoplastic or duroplastic plastic substrate.

29. The joint according to claim 27, wherein the glass-like plastic substrates are selected from polymethyl methacrylate, polycarbonate, or cycloolefin copolymer, and preferably, said plastic substrates are selected from polypropylene.

30. The joint according to one of claims 20 through 29, wherein the adhesive sealant (1) is constructed of one of the adhesives according to claims 1 through 19.

31. A method for producing a joint (5) between a first assembly part (6) and a second assembly part (7), whereby a removable adhesive sealant (1) is applied in the liquid state to a sealing bed of said first assembly part (6), and both of said assembly parts (6, 7) are joined together, wherein the improvement comprises removing said adhesive sealant (1) by grasping at a free end of the adhesive sealant and, in an extension of a level running direction (16) of the sealing bed (8) directed away from both assembly parts (6, 7), withdrawing the adhesive sealant essentially residue-free from said sealing bed (8).

32. The method according to claim 31, wherein the adhesive sealant (1) is applied as a liquid to a first sealing surface (16), arranged on the first assembly part (6), of a lower sealing bed section (14) of the sealing bed (8) by means of a tank melt unit with robotic guidance, and in a subsequent procedure both assembly parts (6, 7) are joined together.

33. The method according to claim 31 or 32, wherein after joining of the second assembly part (7) and a brief cooling phase, said second assembly part (7) is pressed against the first assembly part (6) and finally fixed into position using attachment means (29).

34. In automobile lights or automobile headlights comprising light disks or headlight lenses, preferably having a scratch-resistant finish, composed of a glass-like plastic substrate, and lamp housings composed of a thermoplastic or duroplastic plastic substrate, wherein the improvement comprises said light disks or headlight lenses and lamp housings are attached to the adhesive of at least one of Claims 1 through 18.